

## REMARKS

Upon entry of the present amendment, claims 1, 8 and 9 will be amended, so that claims 1-22 will remain pending with claims 1 and 8 being independent claims.

By the amendment herein, the claims have been amended to even more explicitly recite the claimed subject matter as will be further discussed below.

Reconsideration of the rejections of record, and allowance of the application in view of the following remarks are respectfully requested.

### Statement of Telephone Interview

Applicants express appreciation for the courtesies extended by Examiner Berman to Applicants' representative Arnold Turk during a June 4, 2009 telephone interview.

During the interview, documents crossed through on the Forms PTO-1449 were discussed including the U.S. applications, and foreign language documents, i.e., DD 146716, FR 2494702 and Lee (Item 11). Of these documents, it was noted that FR 2494702 is used in rejections, whereby the Examiner has, in fact, considered this document. The Examiner indicated that the Patent and Trademark Office will prepare an English translation of this French document in view of the inclusion of the French document in rejections. Applicants' representative indicated that DD 146716 was cited and discussed in the specification, and that Applicants were considering submitting English translations of this document as well as Lee. Moreover, it was indicated that the cited applications have been considered in the rejections, and will be relisted for initialing by the Examiner.

The 35 U.S.C. 112, second paragraph, rejection was discussed with the Examiner being referred to pages 2 and 6 of the specification, for the indication that various functional groups/reactants can be used, and that these can be the reactants recited in claim 13.

The amendment of the claims to change "substance" to ---solid--- was discussed with reference to page 6 of the specification, and mutually acceptable amendments to claims 8 and 9 were discussed.

Regarding the art based and obviousness-type double patenting rejections, Applicants' representative pointed out that the rejections did not appear to address that a powder is recited in Applicants' claims. Accordingly, it was indicated that the rejections are without appropriate basis for at least this deficiency.

### **Claim of Foreign Priority**

Applicants express appreciation for the acknowledgement of the claim of foreign priority as well as receipt of the certified copy of the priority application in this national stage application.

### **Information Disclosure Statement**

Applicants also express appreciation for the Examiner's confirmation of consideration of Applicants' Information Disclosure Statement by including an initialed copy the Form PTO-1449 submitted therewith with the Office Action.

However, the Examiner has crossed through DE 146716, FR 2494702 and Lee (Item 11). While the Office Action does not indicate why these documents have been crossed through, during the above-noted telephone interview, the Examiner stated that the documents have been crossed through as not being in English.

Moreover, the Examiner has crossed through two U.S. applications on the Form PTO-1449 without any explanation.

During the above-noted interview, Applicants indicated that the applications are properly cited in accordance with 37 C.F.R. 1.98 and should be indicated as having been considered. Moreover, the citations are being updated on the Form PTO-1449 submitted herewith to include

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the Publication Nos. for the cited applications, i.e., Application No. 10/577619 published as US 20090105436 A1 and Application No. 10/577,300 published as US 2007/0244212 A1.

Regarding the foreign language documents, i.e., DD 146716, FR 2494702 and Lee (Item 11), it is initially noted that FR 2494702 is used in the rejections set forth in the Office Action, and therefore this document has been considered by the Examiner, and should therefore be initialed on the Form PTO-1449 as having been considered. Moreover, during the above-noted telephone interview, the Examiner indicated that the Patent and Trademark Office will prepare an English translation of FR 2494702.

Regarding the remaining documents, i.e. DD 146716 and Lee, Applicants note that DD 146716 is cited and discussed in the specification, in the paragraph beginning at page 3, line 1. Moreover, an English translation of each of these documents is being submitted. Accordingly, consideration of these documents is requested.

Therefore, the Examiner is requested to initial the Form PTO-1449 submitted herewith in a Supplemental Information Disclosure Statement, and to include an initialed copy with the next communication from the Patent and Trademark Office.

Authorization is hereby provided to charge any fee necessary for consideration of the documents to Deposit Account No. 19-0089.

#### **Response To Rejection Under 35 U.S.C. 112, Second Paragraph**

In response to the rejection of claims 1-22 under 35 U.S.C. 112, second paragraph, as being indefinite, Applicants submit the following.

The rejection questions as to which surface the homopolymers, copolymers and terpolymers are coupled. In response, Applicants note that claim 1 explicitly recites that the at

least one of radiation-chemically and plasma-chemically modified polytetrafluoroethylene powder includes a surface, and that the homopolymers, copolymers or terpolymers are radically coupled on the surface. Accordingly, this is to confirm that the homopolymers, copolymers or terpolymers are radically coupled on the surface of the polytetrafluoroethylene powder surface.

The rejection questions the "radiation-chemically" and "plasma-chemically" terminology. In response, Applicants submit that one having ordinary skill in the art would readily understand the scope and content of the claimed subject matter, especially in view of Applicants' specification and the knowledge of one having ordinary skill in the art.

As discussed with the Examiner during the above-noted telephone interview, as disclosed on pages 2 and 6 of Applicants' specification, various functional groups/reactants can be used, and these can be reactants such as recited in Applicants' claim 13.

For example, as disclosed at page 2 of Applicants' specification:

By means of the effect of high-energy radiation with an absorbed dose of approximately 100 kGy, a pourable fine powder is obtained from the fibrous-felted polymers as a result of the partial decomposition of the polymer chains. This powder still contains loose agglomerates that can be easily separated into primary particles with a particle diameter of  $<5\ \mu\text{m}$ . In the case of irradiation in the presence of reactants, functional groups are formed into the polymer. If the irradiation occurs in air, then according to Eq. (9.22) (and subsequent hydrolysis of the  $-\text{COF}$  groups by means of moisture in the air), carboxyl groups result. If, before irradiation,  $(\text{NH}_4)_2\text{SO}_3$  is mixed in, then groups containing S are to be attained. These functional groups reduce the hydrophobia and organophobia of the PTFE so substantially that the resulting fine powder can be easily homogenized with other media. The positive characteristics of PTFE, such as its excellent gliding, separating, and dry lubrication characteristics as well as its high chemical and thermal stability, are maintained. Carboxyl and sulfonic acid groups to which perfluorinated chains are connected also have a high degree of chemical inertness. . . .

Thus, one having ordinary skill in the art would readily understand that the surface of the polytetrafluoroethylene can be chemically modified by radiation and/or plasma treatment. Moreover, depending upon reactants present during the radiation and/or plasma treatment, the

surface will include different functional groups. For example, if oxygen is present, the perfluoroalkyl-(peroxy) radical centers will be expected to be present.

Thus, the PTFE powder can be modified radiation-chemically, for example, by means of electron irradiation or gamma irradiation. As is known, the polymer chains are thereby broken down and persistent (long-lived) reactive perfluoroalkyl(peroxy) radical centers are formed. Such persistent (long-lived) reactive perfluoroalkyl(peroxy) radical centers are also formed when the PTFE powders are modified and broken down by means of a plasma.

In the event that oxygen is present during the radiation-chemical or plasma-chemical modification, persistent (long-lived) reactive perfluoroalkyl(peroxy) radical centers are formed. However, one skilled in the art is aware of this as disclosed in Applicants' specification, such as at the above-noted portion on page 2 of the specification.

In the event that other reactants (besides oxygen) are present, in addition to persistent (long-lived) reactive perfluoroalkyl (peroxy)radical centers, functional groups are also formed during the radiation-chemical or plasma-chemical modification, which functional groups can have an additional positive influence on the coupling reactions in that these functional groups change the interaction behavior or wetting behavior in the reaction system. However, as disclosed, the homopolymers, copolymers or terpolymers would be radically coupled to the surface of the PTFE powder particles.

Regarding the terminology "in substance", as discussed with the Examiner during the above-noted telephone interview, this terminology is clear from Applicants' disclosure. For example, Applicants' specification beginning at the top of page 6, and especially the first two paragraphs on page 6, discusses the terminology "dispersion" and "in substance". Dispersion includes powder present undissolved in liquid, while "in substance" includes that the powder,

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such as PTFE (micro)powder, is processed as a solid, such as a swirled or fluidized PTFE (micro) powder converted advantageously under inert gas in the presence of a monomer (mixture) to the PTFE polymer powder.

The term "in substance" therefore essentially describes a solid, which is also processed as a solid, and as discussed with the Examiner, the claims have been amended to recite "solid".

Regarding claims 8 and 9, Applicants submit that these claims are definite prior to the present amendment. However, in order to advance prosecution of the application, claims 8 and 9 have been amended as discussed with the Examiner during the above-noted telephone interview.

Regarding claim 13, for at least the reasons discussed above, Applicants submit that this claim is definite in reciting the presence of reactants.

Accordingly, the 35 U.S.C. 112, second paragraph, rejection should be withdrawn.

#### **Response to Art Based and Double Patenting Rejections**

The following rejections are set forth in the Office Action

(1) Claims 1-4 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,387,964 to D'Agostino.

(2) Claims 8-10, 13-15, 17, 18 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by FR 2494702 (FR '702).

(3) Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,387,964 to D'Agostino in view of FR 2494702.

(4) Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over FR 2494702 in view of U.S. Patent No. 6,387,964 to D'Agostino.

(5) Claims 16 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over FR 2494702.

(6) Claims 1-22 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-26 of copending Application No. 10/577,300

(7) Claims 1-22 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-20 of copending Application No. 10/577,619

Initially, regarding the rejections set forth in items 2, 3, 4 and 5 application, it is once again noted that FR 2494702 is used in the rejections, but has been crossed through as not having been considered by the Examiner as not being in English. The Examiner indicated that the Patent and Trademark Office will make an English translation of this document, and Applicants therefore await receipt of the English translation.

Moreover, if the rejections over FR 2494702 are maintained or clarified, the next action should not be made final.

Additionally, as discussed with the Examiner during the above-noted telephone interview, it appears that the rejections have not taken into account that Applicants' claims are directed to polytetrafluoroethylene powder. Accordingly, each of the rejections is without appropriate basis in that each rejection does not address this aspect of Applicants' claims. Accordingly, the rejections of record should be withdrawn for at least this reason.

Additionally, FR '702 is directed to an ion-exchange membrane and a method for the production thereof. The ion-exchange membrane comprises a fabric or a film of fluorocarbon polymer, advantageously PTFE, which at the same time is grafted and cross-linked. In order to

produce an ion-exchange membrane of this type, a substrate of fluorocarbon polymer is irradiated with ionizing radiation under oxygen influence, then brought together with a reaction mixture, which contains a monomer to be grafted and a cross-linking agent, and subsequently heated.

FR '702 explicitly discloses that only a film or a fabric can be produced, and does not disclose a PTFE powder as recited in Applicants' claims. The films or fabrics of FR '702 are irradiated with radiation dosages from 1.2 to 2.5 kGy. This is understandable to one skilled in the art, since fluorocarbon polymers in the form disclosed by FR '702 would embrittle with longer and/or more intensive radiation and break down to (micro)powders.

Accordingly, with the method according to FR '702 powders, as recited in Applicants' claims would not be treated. Moreover, high radiation dosages of  $> 50$  kGy as recited in Applicants' claims 3, 4, 11 and 12 would not be used for fabric or films.

Moreover, FR '702 does not disclose a plasma chemical treatment of the materials.

Furthermore, it follows from the low radiation dosage of FR '702 that only a low proportion of fluorocarbon polymers can form radicals or radical centers with very low concentrations, which according to the reaction mechanism given in FR '702 can only be oxygen radicals (peroxy radicals). However, no radical concentration is given in FR '702. However, it would appear that with the method disclosed in FR '702, if any radicals are formed at all, there are so few that they do not and cannot make any contribution to the reaction.

Furthermore, according to FR '702 the irradiation is carried out in air and, as is known, PTFE adsorbs oxygen even without a chemical bonding. A grafting of 10% by weight and more, as is to occur according to FR '702, thus cannot be achieved with these low radical concentrations via a radical coupling.



As far as the cross-linking mechanisms given according to FR '702 are concerned, the reaction mechanism given there under 1. would not appear to proceed in this manner as one skilled in the art will notice right away, since under the given reaction conditions a perfluoroperoxy radical cannot thermally split into a perfluoroxy radical and a free oxygen radical. A mechanism of this type would appear to be unknown to one skilled in the art and has not been proven chemically nor is it theoretically possible, because just as under these reaction conditions an oxygen molecule in biradical form would not break down into two highly reactive oxygen atoms in biradical form. Instead, it will be clear to one skilled in the art that with the presence of a highly active oxygen radical, this would be actively involved in the acrylic acid polymerization, if such a radical compound would form at all with the low reaction temperatures described. This oxygen radical would thus no longer be available for the radical coupling with PTFE.

The further reaction mechanisms of FR '702 according to 2. and 3. relate to the addition of cross-linking agents, which are in contrast to the claimed subject matter wherein radical coupling, not a cross-linking, takes place.

With respect to D'Agostino, a monomer-grafted cross-linked polymer is known, which has been produced through radiation of the polymer, subsequent quenching and cross-linking of the polymer, irradiation again and final contacting with monomers in an aqueous emulsion. D'Agostino discloses polymers which are cross-linked, and D'Agostino does not teach nor suggest PTFE powder. Due to the cross-linking in D'Agostino, monomers polymerize on the perfluoroalkyl (peroxy) radical centers formed after the second irradiation at most on the surface of the network. The monomers cannot penetrate into the network already present in D'Agostino

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and form homopolymers, copolymers or terpolymers there. Thus, D'Agostino is directed to a different product which has been produced in a different manner.

Accordingly, for at least the reasons set forth above, the rejection of record should be withdrawn.

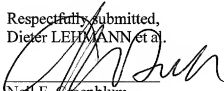
### CONCLUSION

In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the rejections of record, and allow each of the pending claims.

Applicants therefore respectfully request that an early indication of allowance of the application be indicated by the mailing of the Notices of Allowance and Allowability.

Should the Examiner have any questions regarding this application, the Examiner is invited to contact the undersigned at the below-listed telephone number.

Respectfully submitted,  
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